

Direct Current Incandescent Lighting

The Mather Electric Company

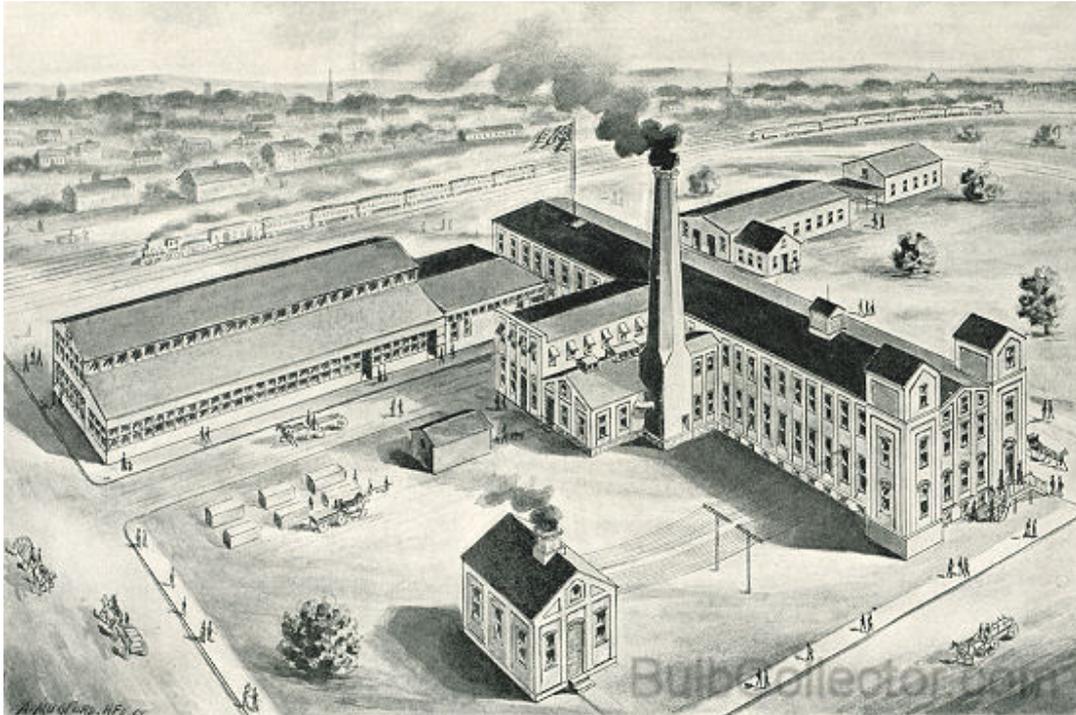


**Direct Current
Incandescent Lighting.**

DIMENSIONS OF DYNAMOS.

CORRECTED TO JANUARY 1ST, 1893.

Capacity in K.-W. 125 Volts.	AMP.	Approx. — SPEED. —		PULLEY.		BRUSHES.			Approx. Weight.	FLOOR SPACE.	Height.
		¹²⁵ Volts.	¹¹⁵ Volts.	D.	F.	No.	Leaves	W. Inch.			
3.5	28	3,050	2,800	5	3½	4	25	¾	470	27 x 27	32
7.	56	2,100	1,950	8	5½	4	25	1	1,120	38 x 32	38
10.5	84	1,650	1,500	11	6½	4	45	1¼	1,700	43 x 30	53
17.	137	1,500	1,400	13	6½	6	45	1	2,744	49 x 43	54
25.	193	1,400	1,325	14	8½	8	45	1	3,644	55 x 43	59
30.	240	1,000	925	18	8½	8	45	1	3,050	58 x 43	56
36.	288	950	900	20	10½	8	45	1¼	4,800	64 x 56	68
41.	330	950	900	20	10½	8	45	1¼	5,300	64 x 56	68
55.	440	800	750	20	10½	8	45	1¼	7,000	69 x 56	64
69.	550	800	750	22	12½	10	60	1¼	8,500	72 x 56	75



FACTORIES,
THE MATHER ELECTRIC COMPANY, MANCHESTER, CONNECTICUT

The Mather Electric Company deems it necessary, in view of the recently formed combinations in the electrical business, to state that it is entirely independent of any and all such combinations.

The Mather System of Incandescent Lighting and Transmission of Power is owned and controlled absolutely by The Mather Electric Company, and the business of manufacturing and installing the Mather apparatus will in the future as in the past be conducted without reference to, or association with, any other company.

The Mather Electric Company believes that there is room in this country for an independent company, manufacturing and selling its apparatus on the basis of merit, and expecting a reasonable profit on capital actually invested; to that class of customers who appreciate independence and the advantages of fair competition. The Mather Electric Company especially addresses this circular descriptive of its system, assuring them that this Company always has been in control of its own business, is now in control, and proposes to remain so in the future. The Mather Electric Company is not for sale now or in the future. All statements to the contrary, from whatever source, are false.

INCANDESCENT electric lighting is fast taking the place of all other means of artificial illumination; this is due to the fact that it possesses qualities most desirable, and not to be found in any other light.

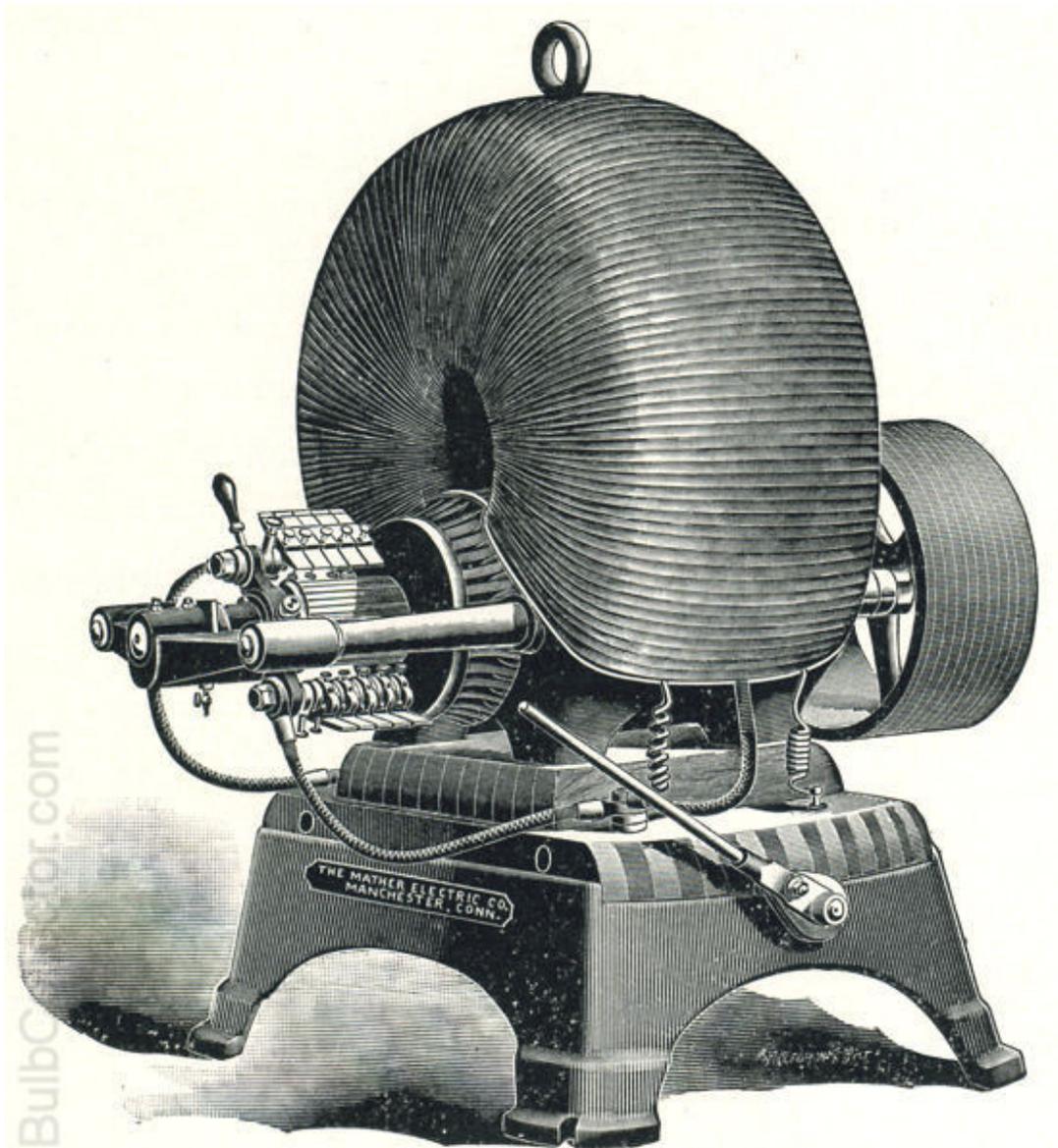
With its use there is no danger to life, and the risk of fire is reduced to a minimum ;

there is no overheating or vitiating of the air, both of which are injurious to the health as well as destructive to decorations and fabrics of all kinds; the light can be divided ; that is, lamps of different candle-power burned on the same circuit, and in any place or position; the trouble due to shadows is entirely avoided ; and for manufacturing purposes in general, its economy alone gives it the preference.

It is the most flexible light, as it can be placed in any position. It will burn without a flicker in a gale of wind, and, in short, is thoroughly practicable where gas and other illuminants are useless.

It is the safest light, because there is no flame exposed at any time, and the necessity of carrying lighted torches, tapers, or matches from place to place is done away with.

Should the lamp be broken, the only effect would be the extinguishing of the light. This claim of absolute safety is attested by the various boards of fire underwriters, in the reductions made in insurance rates where the electric light is used instead of gas or oil.



THE MATHER INCANDESCENT DYNAMO
This type of machine is furnished from 50 to 1,000 lights capacity.

The Mather Incandescent System

The incandescent electric lighting system introduced by The Mather Electric Company in 1884 was the result of careful study and of a determination to develop and place upon the market a system of electric lighting suitable for use under all the varying circumstances attending a system of artificial lighting.

With this end in view the Mather system was carefully developed by the best talent, both electrical and mechanical, to be obtained.

The result of these efforts has been successful beyond the most sanguine expectations of the founders of the company. The system has been very widely

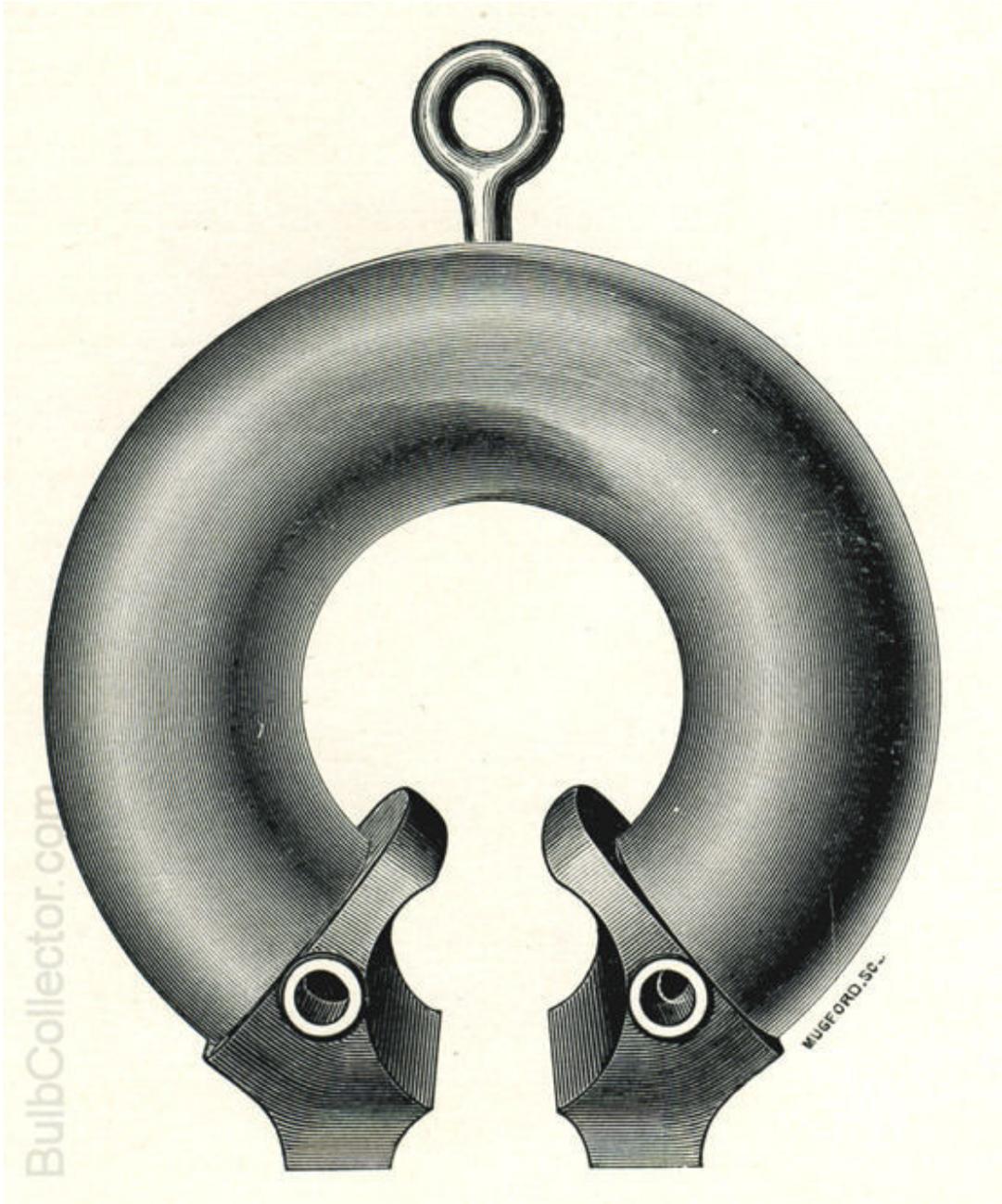
and always favorably known. The strongest point and most emphatic proof of the success of the system is the long list of customers among that class of users who always believe that "the best is the cheapest," and who, therefore, take time and trouble to investigate before buying, and thus, when they buy, do succeed in getting the best. No other system can begin to show such a long list of users among the many prominent and representative business houses of this country. A reference to the list of customers will demonstrate this claim to be amply proved, and the strongest claims for consideration that the system presents are references to the work already accomplished.

In the development of the system the following points were especially aimed at : — SIMPLICITY. — In order that the system might be universally used; that it might not require special and expert care ; that there should be the smallest possible number of wearing parts; that there should be the least liability to get out of order; that the system should be absolutely reliable under all circumstances,
The Mather dynamo has the least number of parts and is the simplest dynamo electric machine ever produced.

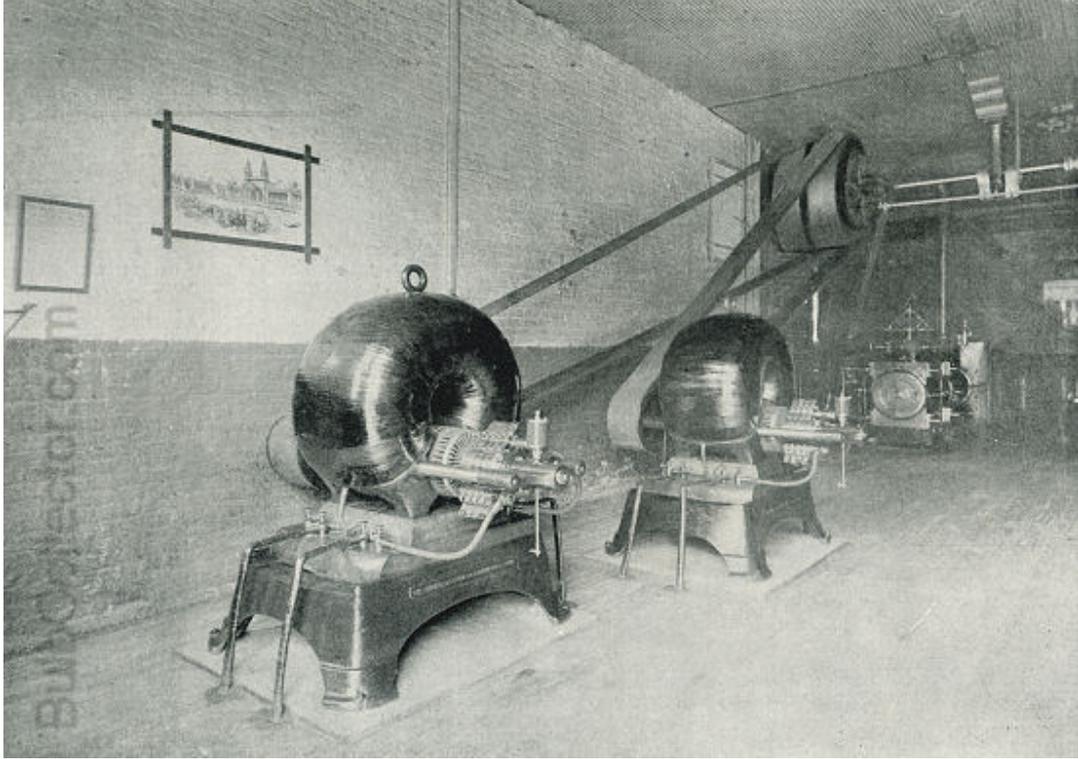
EFFICIENCY. — The Mather dynamo is constructed upon thoroughly scientific principles and is theoretically perfect in electrical design. The electrical efficiency of the dynamo, therefore, is extremely high — higher than even claimed for other machines. The electrical design lends itself very readily to superior mechanical construction, and full advantage of this fact has been taken, the result being a machine perfect in its mechanical details. The result is that the commercial efficiency of the system is the highest ever produced in the mechanical generation of electricity.

Repeated tests of the system have confirmed the above statements, and the frequency with which other systems have been displaced by the Mather system is ample proof that all the claims of superiority made for the system are abundantly borne out in practical work.

The details of the system are fully described in the following pages.



THE FIELD MAGNET



INSTALLATION
Western Wheel Works, Chicago, Illinois.

The Field Magnet

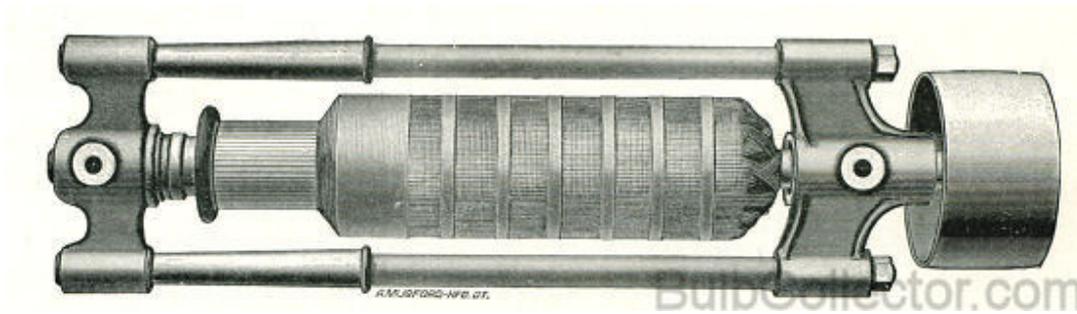
The field magnet is of iron, as in other systems, but in form entirely different. Other things being equal, the shape and number of pieces of which a magnet is composed determine its strength. Referring to the cut, it will be seen that the form of the magnet is that of a broken ring; there are no joints, breaks, or abrupt corners to oppose the passage of or to direct the lines of force — points of as great importance in a magnet as that steam and water pipes should have as few joints and turns as possible. We have the best possible form; that is, the "horse-shoe" magnet, every part of which is covered by the wire, and the armature occupies the best possible position ; that is, between the poles of the magnet.

The advantage, electrically, of the form of magnet used in the Mather System is so great that carefully conducted tests have shown that a field magnet composed of one casting without joints of any kind crossing the magnetic circuit, and *made of cast iron*, is more efficient than a similar field made of wrought iron but made of several pieces with joints across the magnetic circuit.

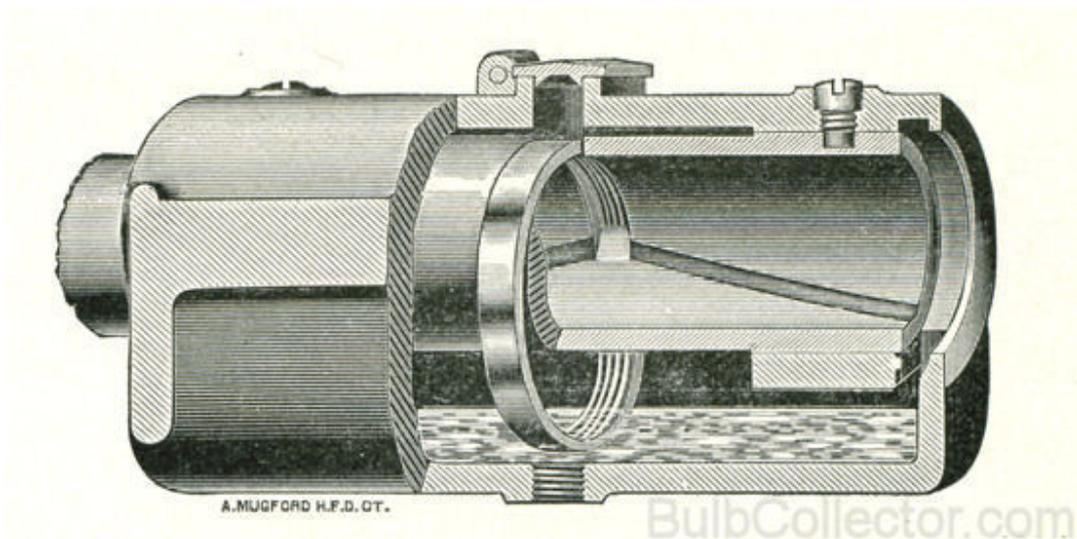
A large part of the success of the Mather System is due to this particular form of field magnet, which is fully covered by patents.

Through each pole of the magnet a side-rod passes ; these in turn support at each

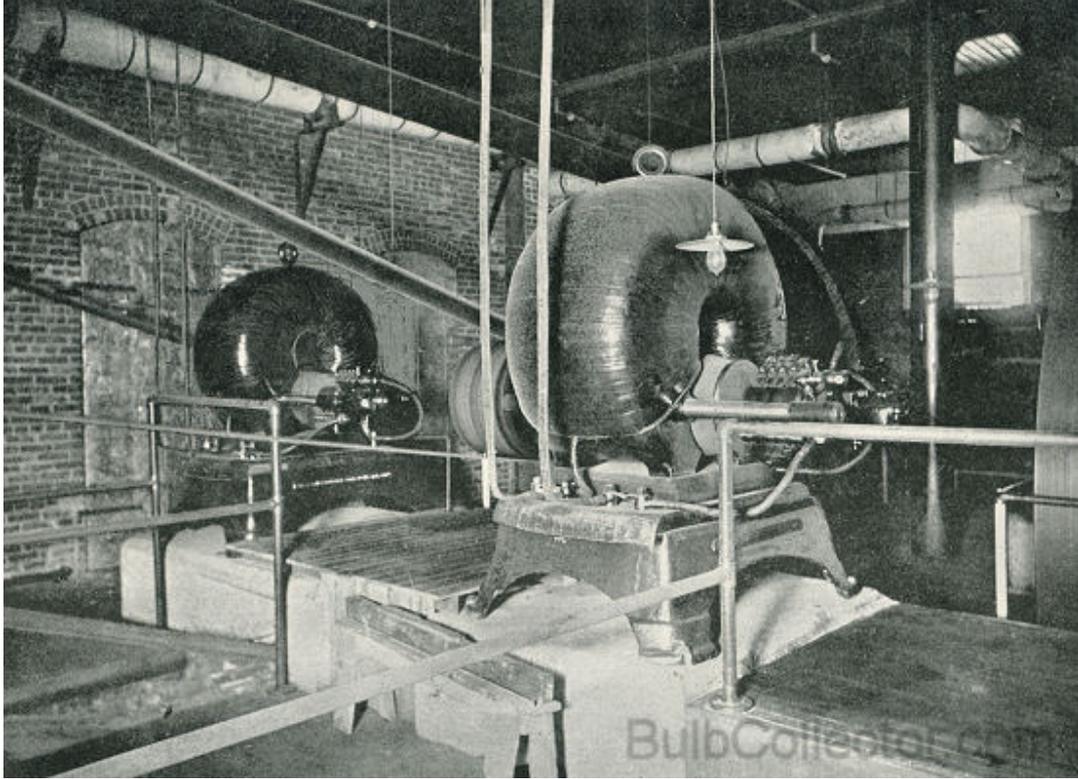
end a yoke which forms the bearings, the whole being firmly secured by two nuts only ; it will be seen that the number of parts has been reduced to the fewest possible, and under no circumstances whatever can they change their relative positions.



THE MATHER ARMATURE



THE MATHER SELF-OILING BEARINGS



INSTALLATION.

Youth's Companion Building, Boston, Mass.

The Mather Armature

The armature is a modification of the well-known Siemens type.

The winding of the armature has been most carefully designed, the object being to design an armature that would produce the current without the destructive sparking common to most machines, and at the same time to do away with all unnecessary losses due to Foucault currents and other sources of loss.

The armature is very carefully balanced, in order that it may run perfectly true and without the slightest vibration. So carefully is this point worked out that a 1,000-light dynamo cannot be heard at a distance of a few feet, when in operation carrying its full load.

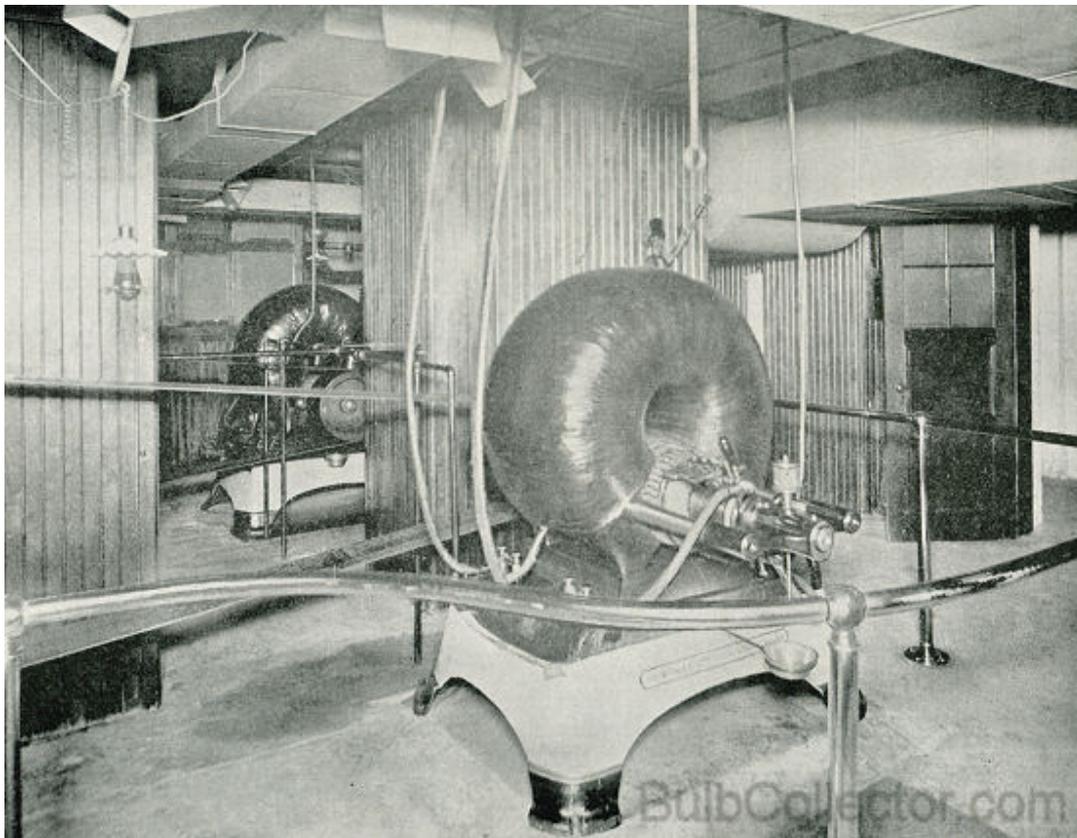
The proportions of the armature and field are such that when operating under full load continuously there is no unnecessary heating. This is an extremely important point, as many dynamos cannot be run under full load any length of time without heating to a dangerous degree, with the accompanying great waste of power. All Mather dynamos may be run under full load for any length of time desired.

The shaft is of the best quality of steel, ground on dead-centres; it is of ample size to ensure stiffness and to prevent any tendency to "springing."

The Self-Oiling Bearings

The bearings are self-oiling, and the plan employed ensures the continuous flooding of the entire length with oil.

By reference to the cut, it will be seen that the journal runs in a hard metal bushing held in a yoke in which is an oil cavity. A notch is cut in the upper side of the bushing. In this notch runs a ring, which rests on the top of the shaft and surrounds the bushing. The lower side of this ring is in the oil in the oil cavity, and the oil brought up by the ring is caught by the edges of the notch in the bushing, and flows through grooves inside the bushing and extending obliquely downward to the ends. When the machine is running, oil flows in constant streams from the ends of the grooves.



INSTALLATION.
Progress Club, New York

The Mather Commutator

The most delicate and sensitive parts of a dynamo are the commutator and brushes, as they are subject to constant use and wear. It is at this point that the perfect balance, electrically and mechanically, of the Mather dynamo is most

conspicuously shown. The dynamos of other systems always spark more or less at the commutator. Sparking at the commutator is the cause of most of the troubles that come to users of electric lighting apparatus; it always means the consumption of metal; always produces a roughened surface on the commutator, which soon causes it to be turned down, thus soon necessitating a new commutator at considerable expense. In the Mather dynamo this destructive evil of sparking is entirely overcome. The methods of constructing the commutator and of winding the armature are such that without the aid of outside appliances of any kind the machine runs absolutely without sparking when once the brushes are properly adjusted.

The brushes are so arranged that each can be adjusted independently; or by a simple and effective device all can be set or removed from the commutator by a single movement. The brushes are arranged that one or more may be removed from the brush-holder while the machine is in operation, without in any way affecting the running of the machine or the lights.

Automatic Regulation

No system of artificial lighting can be considered thoroughly practical which is not entirely flexible and which does not allow all the lights to be used or not, as desired. The manufacturers of all systems have realized this and have endeavored by various devices outside the dynamo itself to render their systems automatic. "Automatic Regulators," so called, have been used, but universally without success. The Mather dynamo is a perfectly automatic machine in itself, regulating absolutely under all changes of load, without outside "regulators" or other devices; the brushes once properly adjusted, no further attention is necessary, even under extreme changes of load. The Mather dynamo is also automatic in its consumption of power, requiring power only in exact proportion to the amount of actual work being done at any given moment.

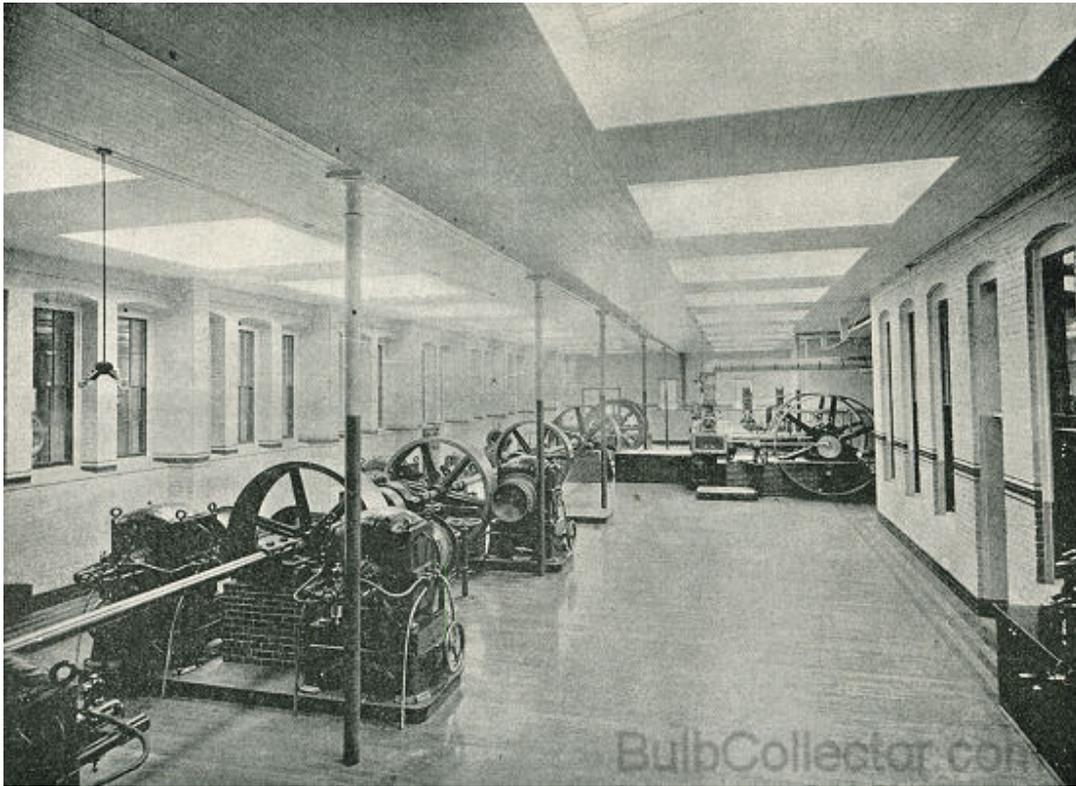
High Efficiency

The Mather incandescent dynamo being built upon thoroughly scientific principles carried out with the best mechanical construction, as described above, gives the highest commercial efficiency of any dynamo in the market, combined with the greatest simplicity and least liability to get out of order. The Mather dynamo does not require special or expert care; any engineer can operate it with perfect success, and so little time and attention are required in its operation that it will not interfere in any way with other duties.

Size of Dynamos

The Mather dynamos are manufactured in capacities varying from 50 to 3,000 lights of 16 candle-power each. They are regularly constructed with compound winding for a constant potential of 125 volts, but can be furnished of any desired

potential to order at short notice. Special machines for marine and other situations, where the conditions require other than the regular type of machines, are supplied promptly. All the machines manufactured by the Mather Company are mounted upon substantial iron subbases fitted with adjustable screws for controlling the tension of the belt. The dynamos are so constructed that the armatures can run in either direction as desired.



INSTALLATION.

American Waltham Watch Company, Waltham, Mass.



SWITCHBOARD
American Waltham Watch Company

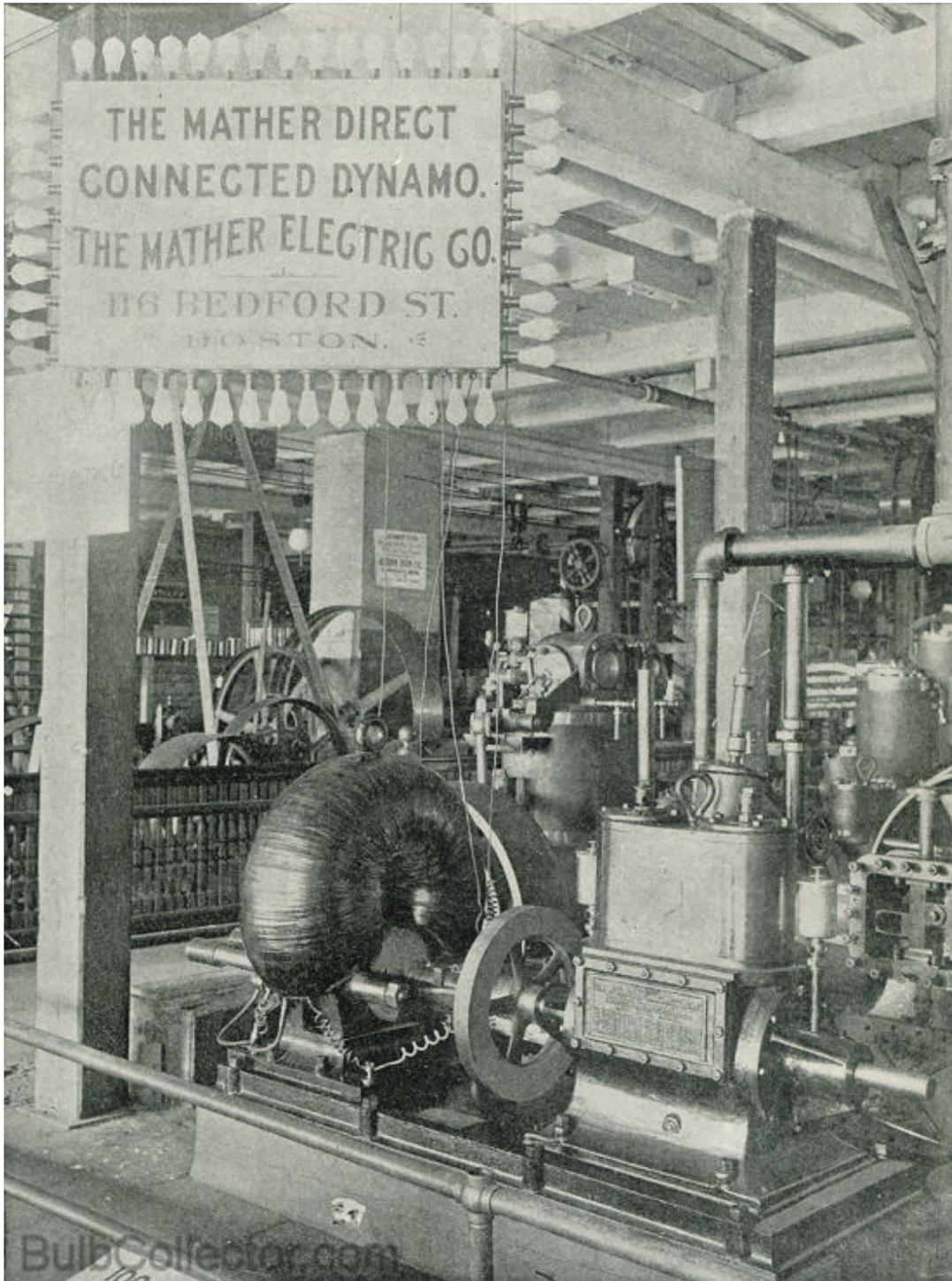
Direct Coupled Dynamos

In large cities where space is very valuable, it has been found necessary to devise some means by which all shafting and belting can be done away with.

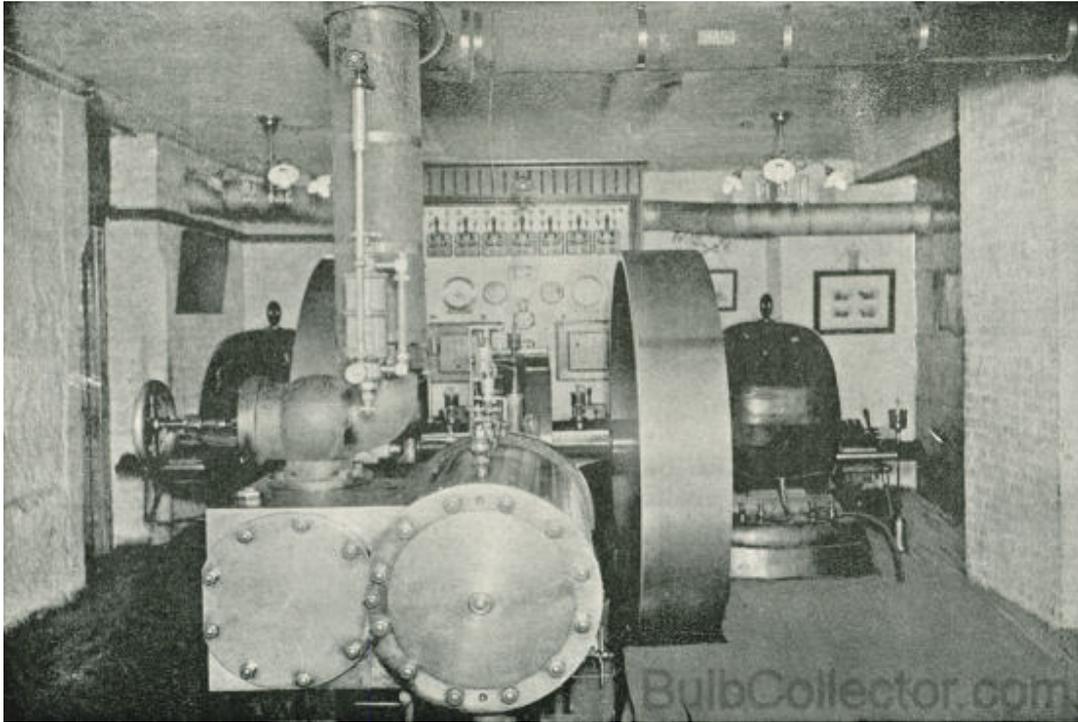
With this end in view we have placed upon the market a special slow-speed multipolar dynamo which may be coupled direct to any high-speed engine.

We are also prepared to fill orders for direct coupled power generators for street railway use.

The accompanying cut illustrates our "Kodak." This consists of a too-light Mather dynamo coupled direct to a ten horse-power engine. This outfit will be found particularly well adapted for marine use; also, where factories and stores are cramped for room or desire a small plant to run independently of their large engine.



INSTALLATION.
Mechanics Fair Building, Boston, Mass.



INSTALLATION.
Shoe and Leather Exchange, Boston, Mass.

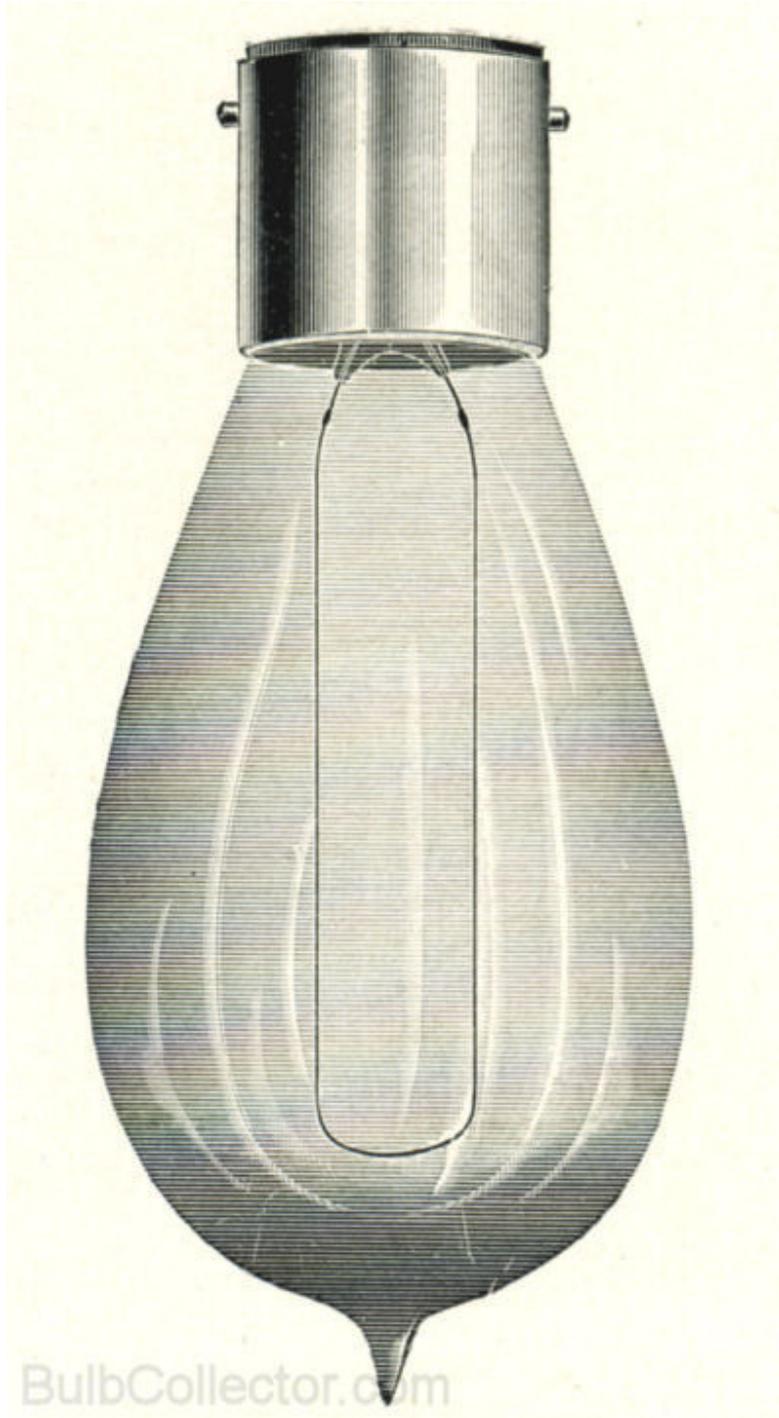
The Incandescent Lamp

The lamp used by the Mather System is the well-known PERKINS Lamp. This lamp had up to 1889 been manufactured for use only on the Mather System, and it has always been manufactured at the factory of The Mather Electric Company. The demand for this lamp by the users of other systems of electric lighting has been so large that a company has recently been formed to carry on its manufacture and sale. This company, "The Perkins Electric Lamp Company," will manufacture incandescent lamps for the general market as well as for The Mather Electric Company.

In all the essentials of a good incandescent lamp the PERKINS Lamp excels any lamp hitherto brought out. It has now been in use since 1883, and its record has been remarkable.

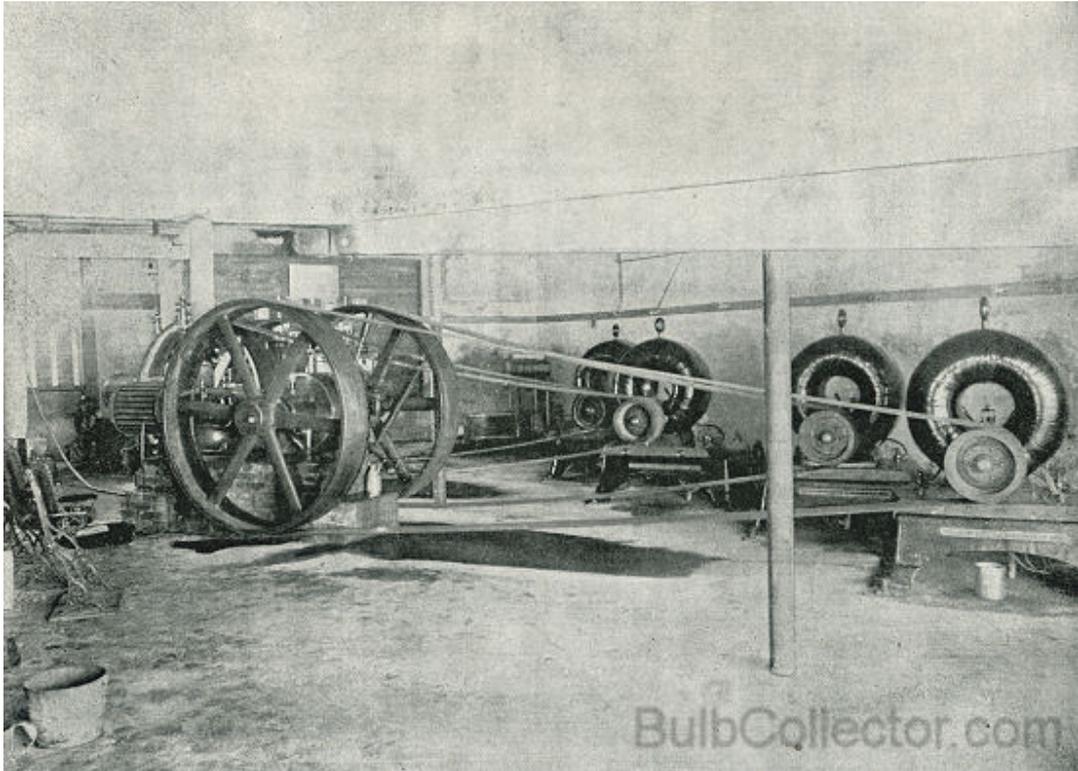
Inasmuch as the PERKINS Lamp is so widely known and universally approved, we will not here go into a detailed description, but: state that there is no other lamp in the market that has such "long life" and "high efficiency" combined as the PERKINS Lamp; no other is so free from the "discoloration of the bulb" usually found in lamps of other manufacturers after short use.

The efficiency of the PERKINS Lamp is so high that when combined with the Mather dynamo it produces more actual candle-power per horse-power throughout its average life than any other incandescent lamp yet produced.



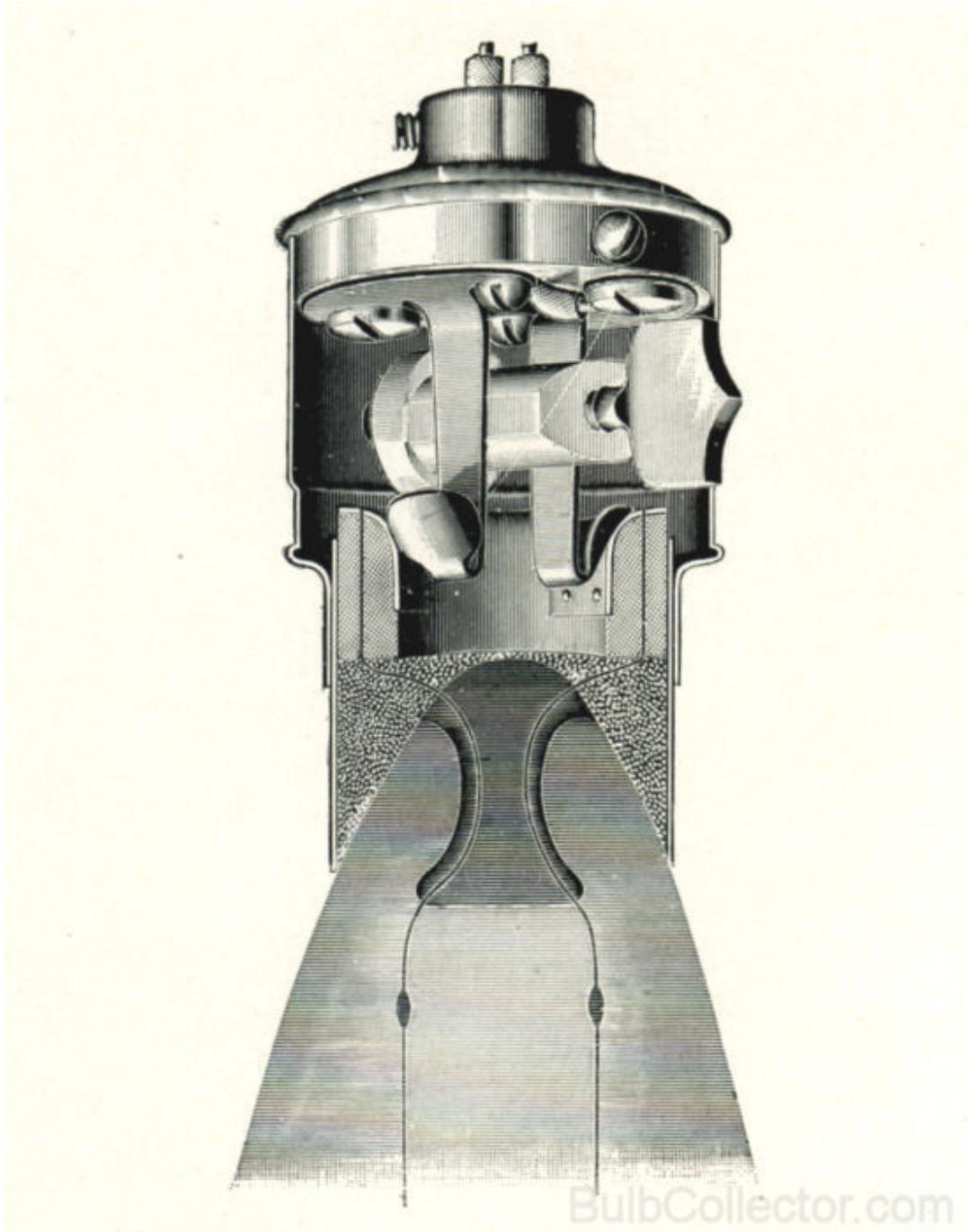
BulbCollector.com

THE PERKINS INCANDESCENT LAMP



INSTALLATION.
California Hotel and Theatre, San Francisco, Cal.

The Double Pole Key Socket

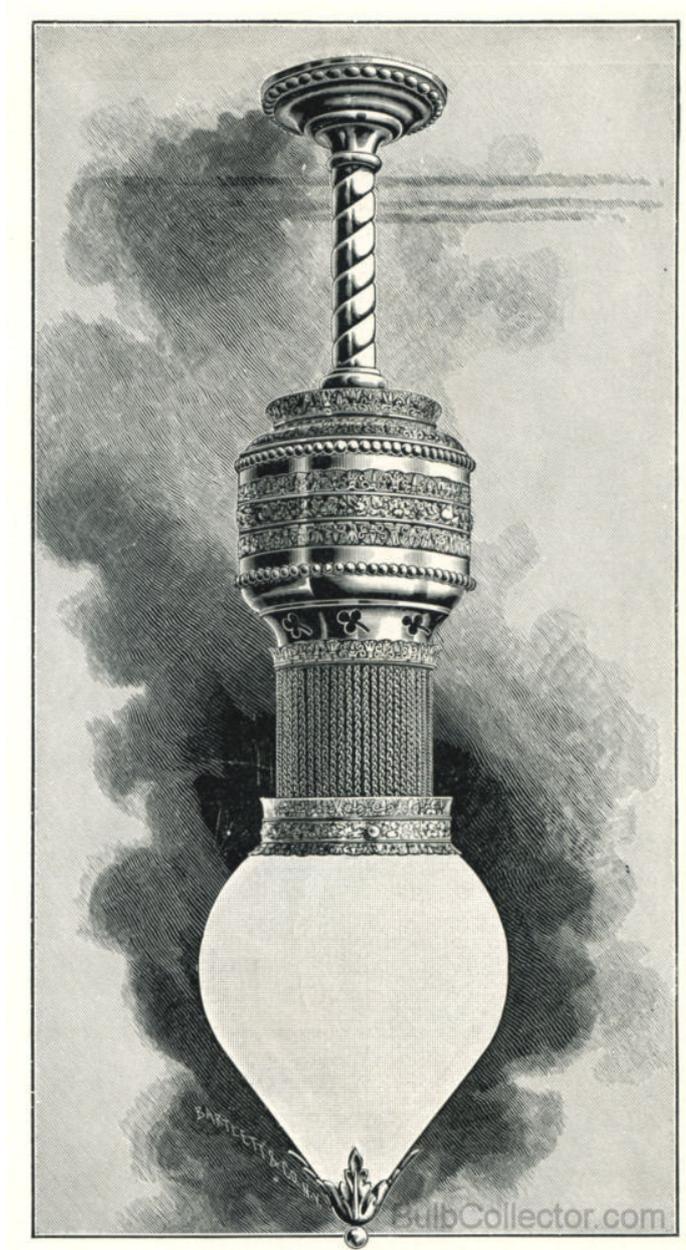


DOUBLE-POLE SOCKET.

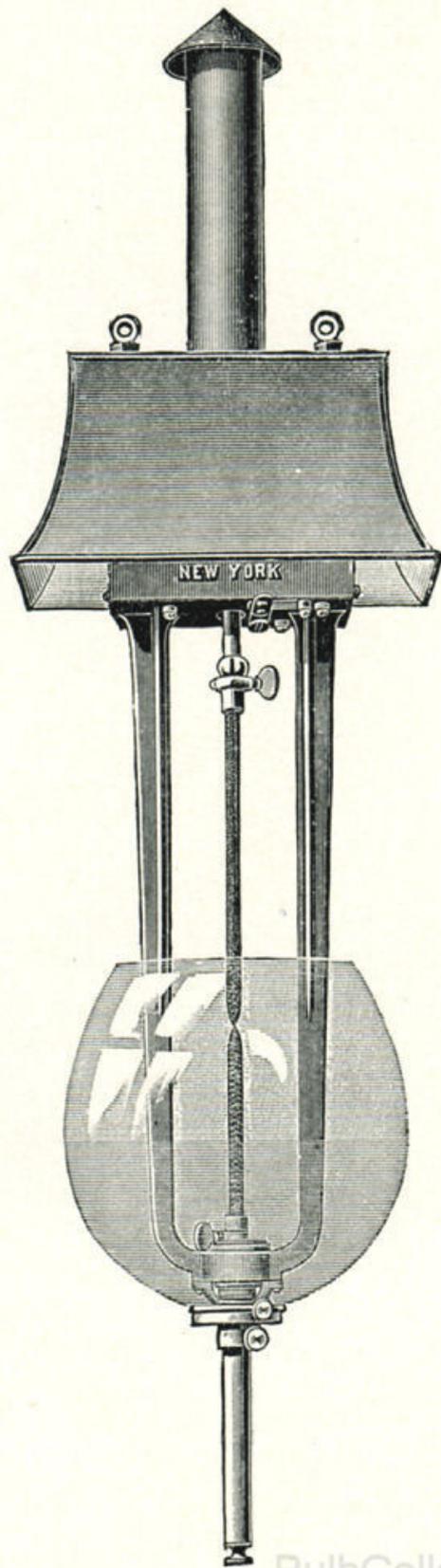
The above cut shows the key-socket used by the Mather Company. It is a double-pole socket, and the only one in the market. The parts are very few in number, and the socket is so simple that it is not liable to get out of order.

It is constructed entirely of metal and porcelain, and is therefore both moisture- and fire-proof.

The double-pole feature is of special value, as it prevents the "burning out" of sockets so common in the single-pole sockets of all other systems.



ORNAMENTAL ARC LAMP FOR INCANDESCENT CIRCUITS.



ARC LAMP FOR INCANDESCENT CIRCUITS.
From 600 to 3,000 Candle Power.

Arc Lamps

Nearly all the large retail and wholesale establishments of the country have adopted electricity for lighting purposes, and the large majority of them operate their own plants. In all such places there is an occasional demand for arc lights, but the great danger to life and liability of fire in using the " series arc system " has caused many to hesitate before adopting it. To overcome this we have perfected the system of arc lighting from the incandescent current, which renders possible for the first time a perfect electric lighting system, the arc and incandescent lamps on one circuit, operated by the same dynamo, measured when desirable through one meter, and both governed by the same rules of safety.

Requiring but 45 volts, it will burn in series in any number, according to the voltage of the circuit; that is, 1 on a 50-volt circuit; 2 on 100 to 125 volts ; 4 on 200 to 220, and 10 on 500 volts.

In all cases a suitable resistance is furnished with each lamp, or pair of lamps, to compensate for the difference in voltage above that actually required for the lamps.

The light is absolutely steady and does not interfere in the least with the incandescent lamps.

The light is a beautiful white, brilliant arc, without flicker or noise.

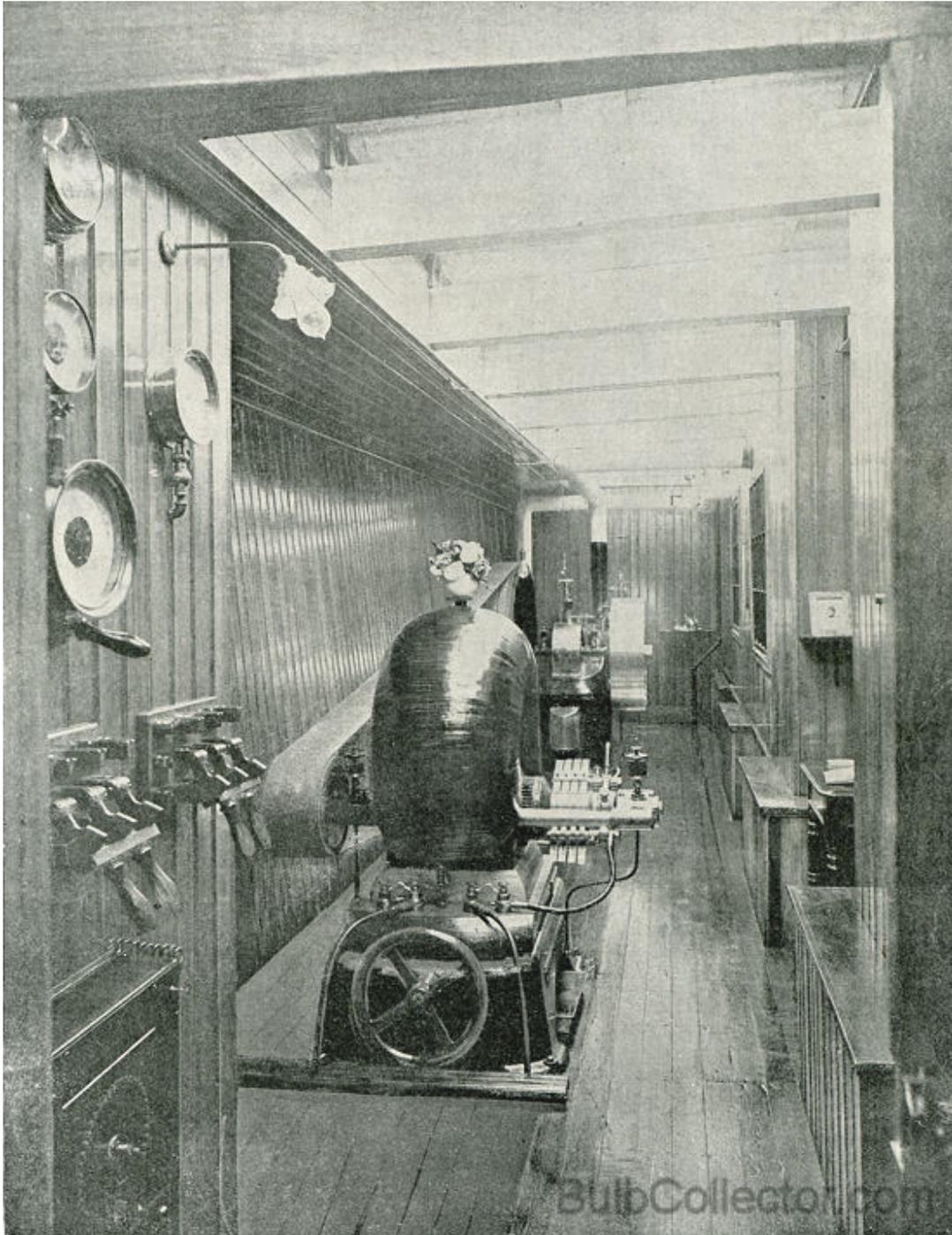
The incandescent lamp of small candle-power is admitted to be the best artificial illuminant known.

The Arc lamp is simply an immense incandescent lamp, as it were — the light of many small lamps concentrated in one.

To illustrate the value of a combined arc and incandescent system in the lighting of such places as depots, a low-tension, high-efficiency dynamo is installed. The offices and waiting-rooms are lighted with incandescent lamps, while the entrances and large areas may be brilliantly illuminated by use of the arc lamps burning on the same circuit.

The same principle applies to factories, warehouses, large stores, docks, machine-shops, foundries, public halls, theatres, and so on.

The efficiency of the Mather incandescent dynamo is so much higher than that of any series arc dynamo that arc lights operated from the Mather dynamo require less power than if run from any of the various types of series arc dynamos.



INSTALLATION.
DeL. Sheplie & Co., Boston, Mass.

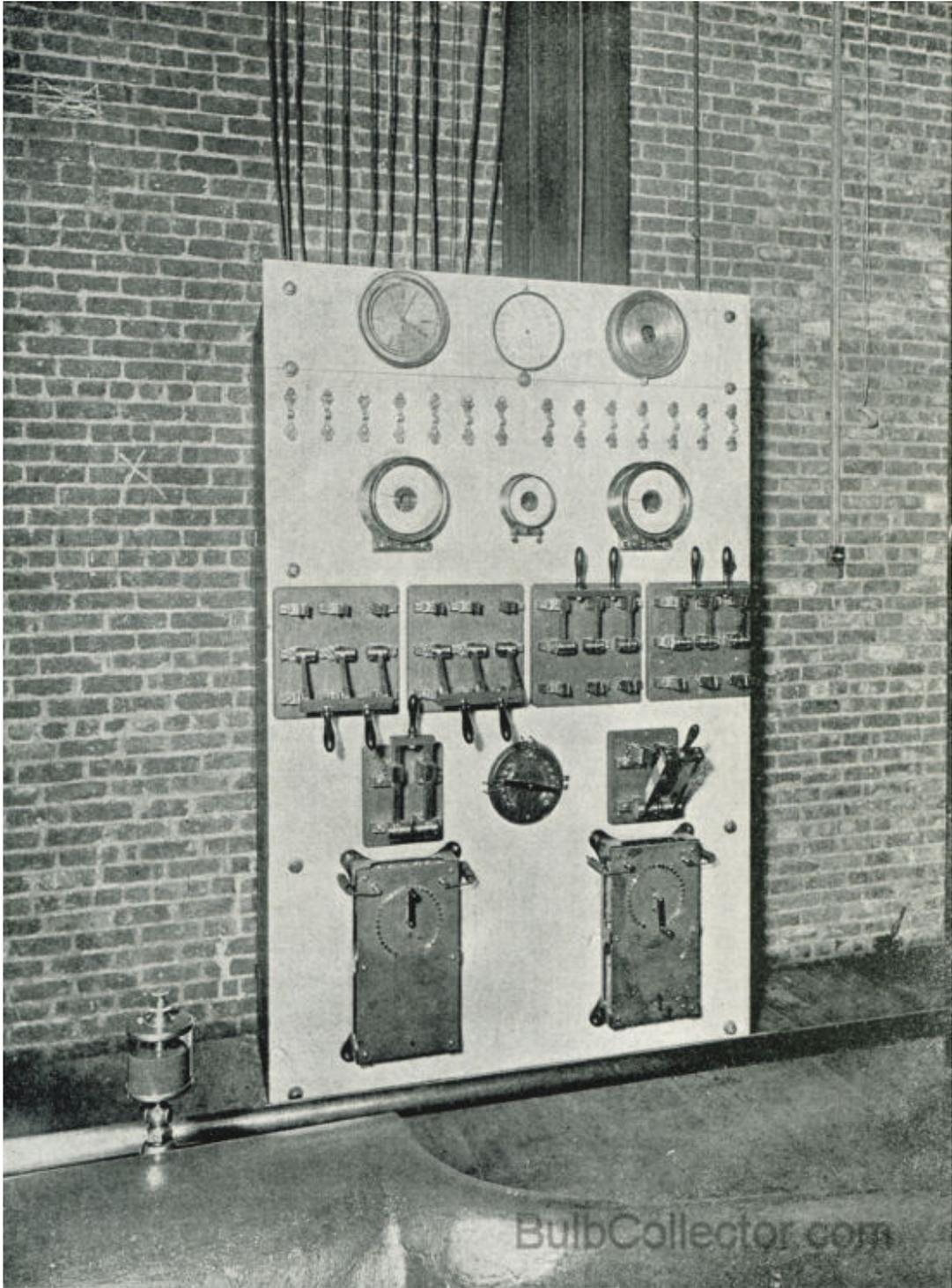
The Switchboard

The various details of the switchboard manufactured and used in connection with the plants of the Mather System have been carefully developed, and are so arranged that the various combinations can be handled with the least complication.

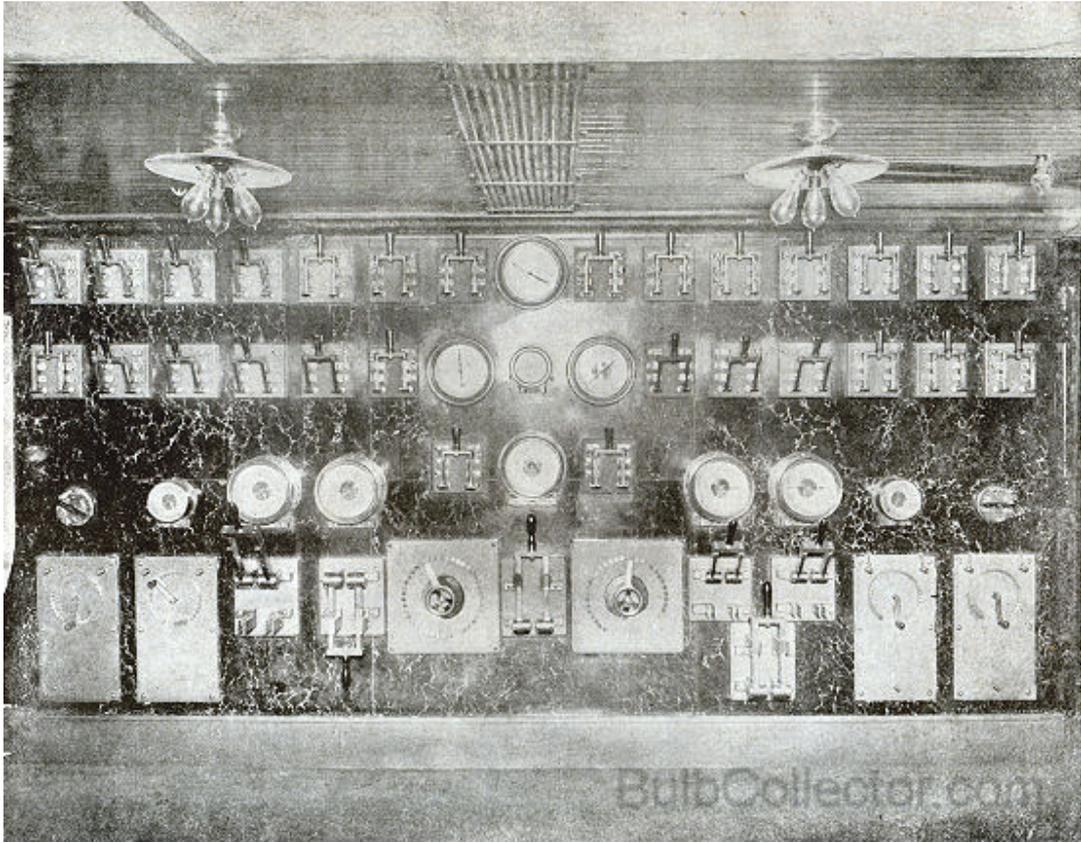
The ampere-meters, for measuring the quantity of current, and the volt-meters, for measuring the electromotive force or pressure, are made on the steam-gauge pattern, mounted in polished brass cases in the most substantial manner.

The various switches for handling the current are also made of polished brass and have ample contact surfaces and carrying capacity; they are mounted upon slate or marble bases, and are therefore incombustible.

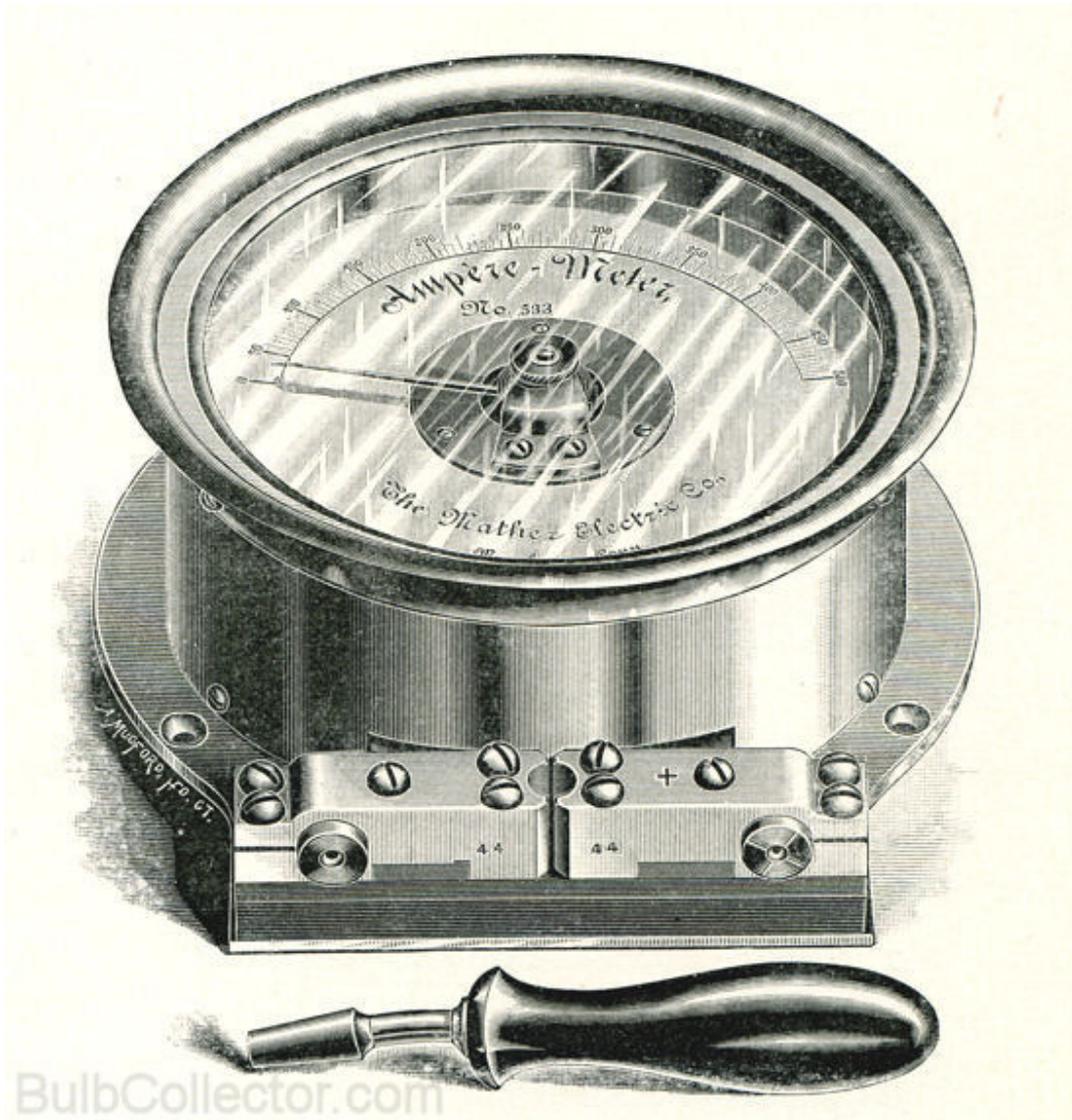
The rheostats used by the Mather System are of the simplest construction, not liable to get out of order, and are also incombustible. The above instruments, when systematically and properly arranged, make a very handsome appearance, as will be seen from the illustrations of switchboards already installed, in this pamphlet.



SWITCHBOARD FOR ISOLATED PLANT.



CENTRAL STATION SWITCHBOARD.



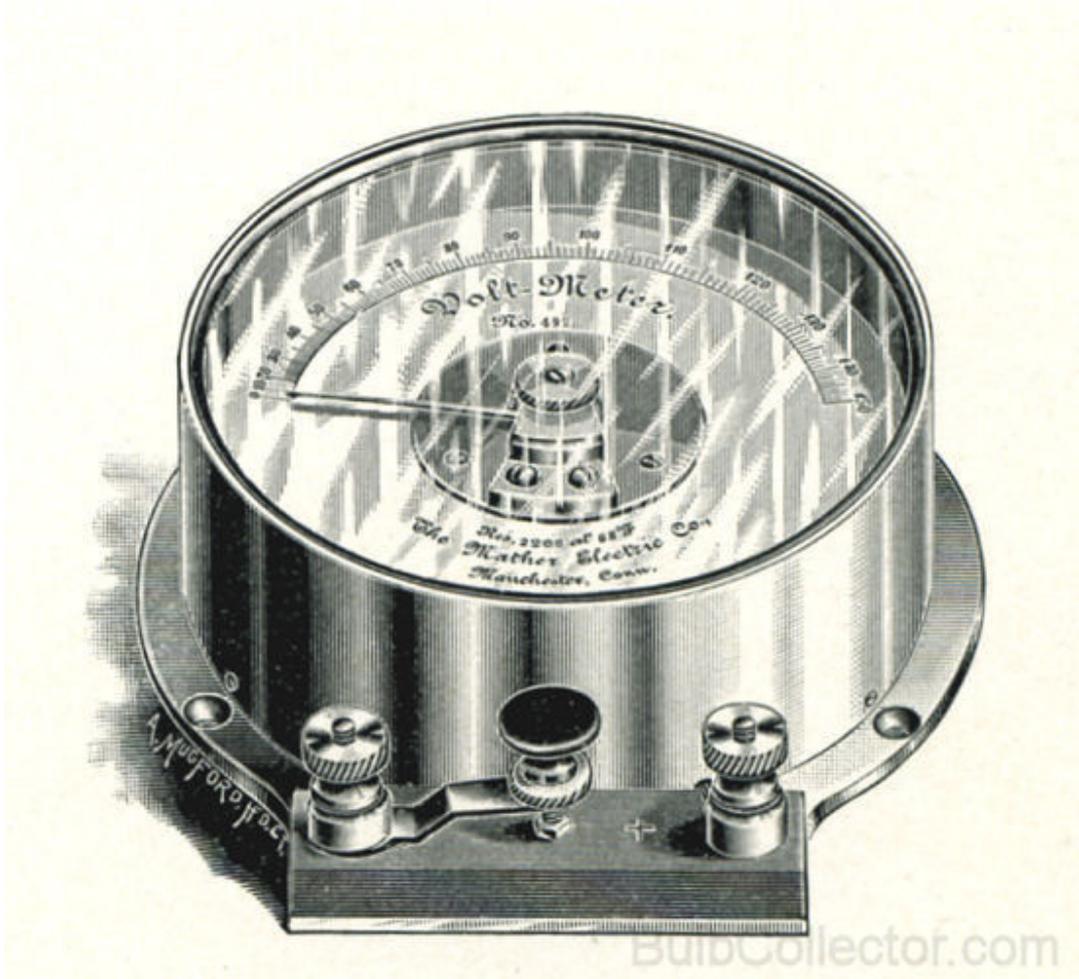
THE MATHER AMPERE-METER.

The Mather Meters

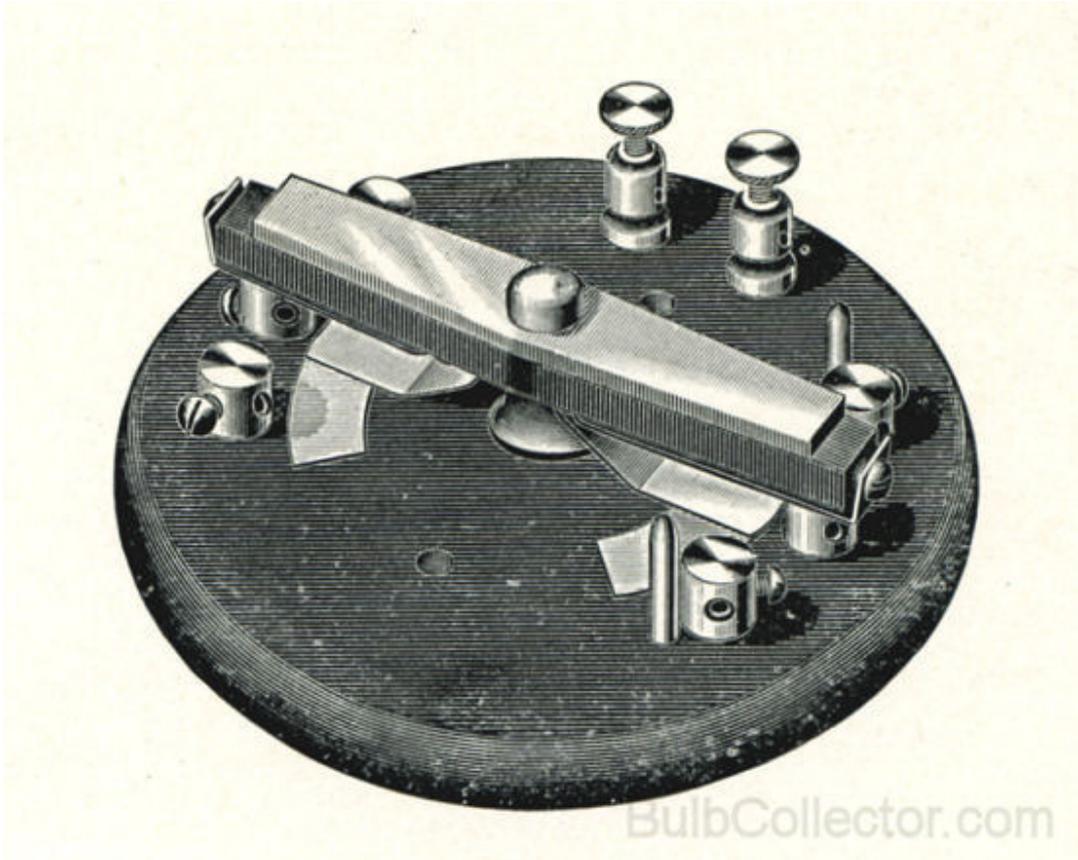
The accompanying cuts illustrate the Mather Voltmeters and Ammeters. In form they are of the " steam-gauge " pattern.

All instruments are finely finished, the cases being highly polished and lacquered, and present a very handsome appearance.

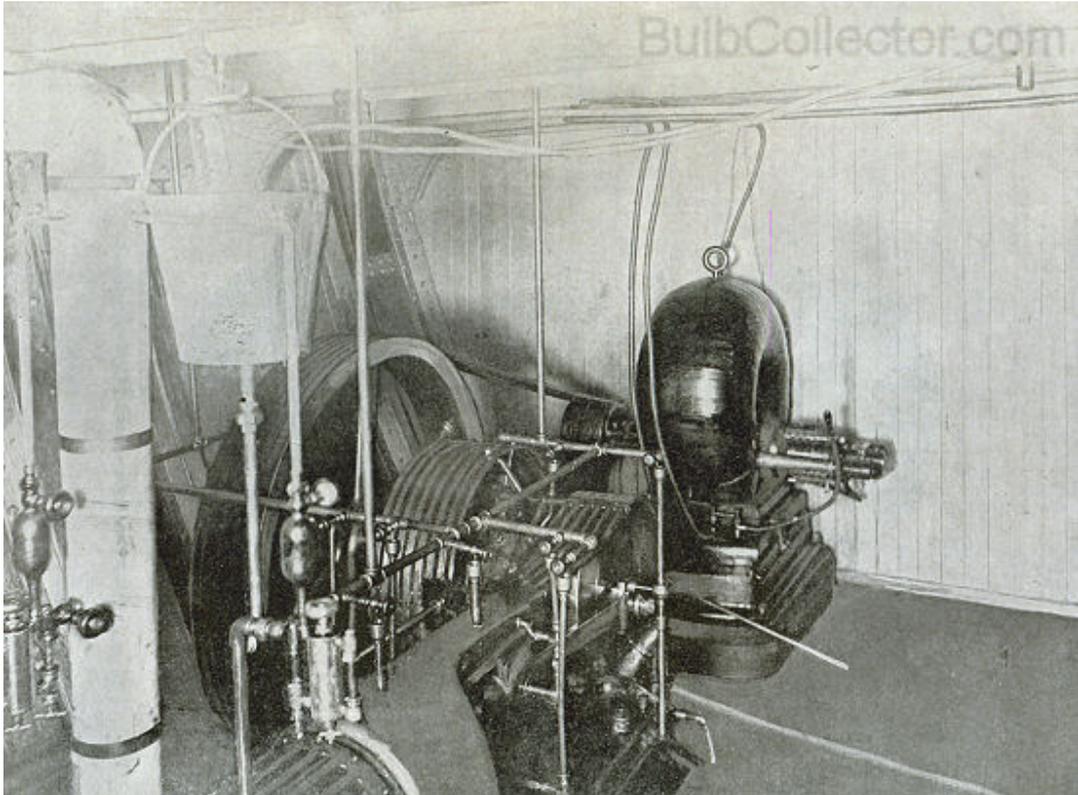
Great care is taken in their calibration, and their accuracy is guaranteed. These instruments are made for any reading up to six hundred volts and five hundred and fifty amperes. Special sizes to order. They may be left in or out of circuit as desired.



THE MATHER VOLT-METER.



THE MATHER VOLT-METER.
To control any number of circuits.

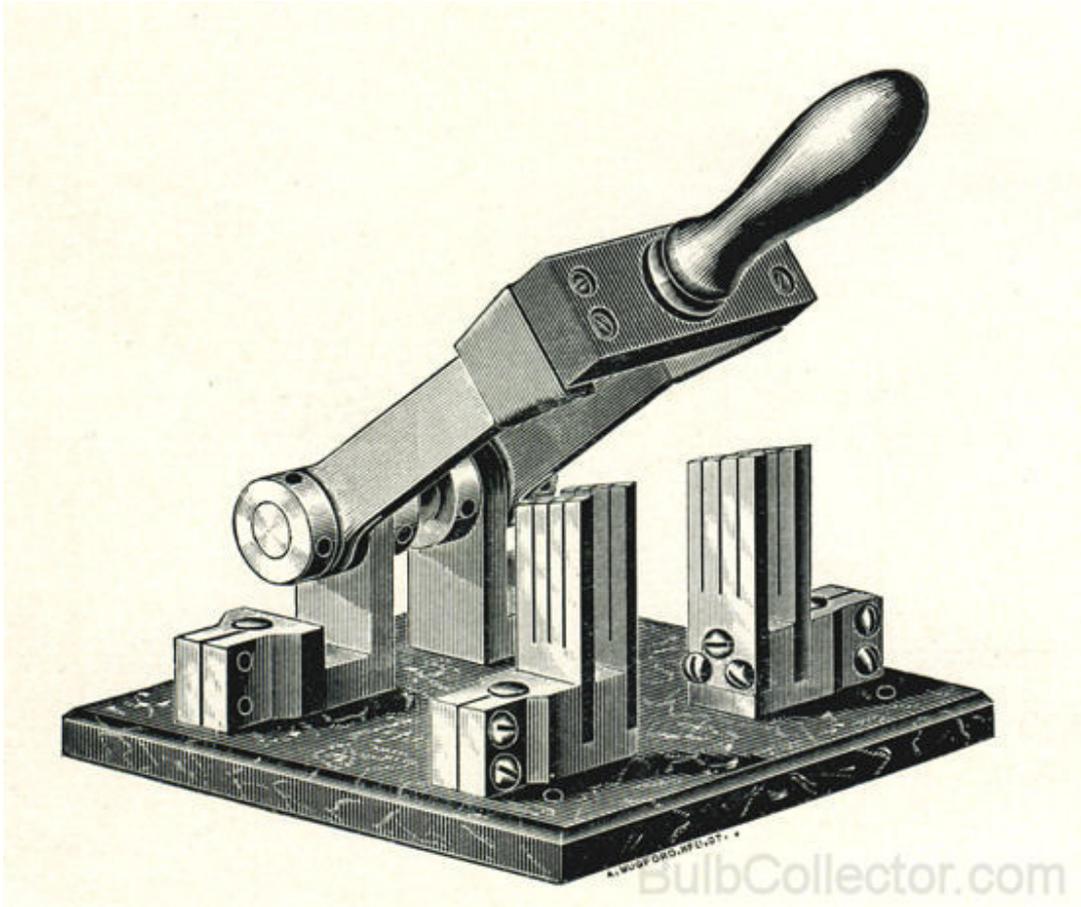


INSTALLATION.
Steamer "Virginia," Goodrich Line.

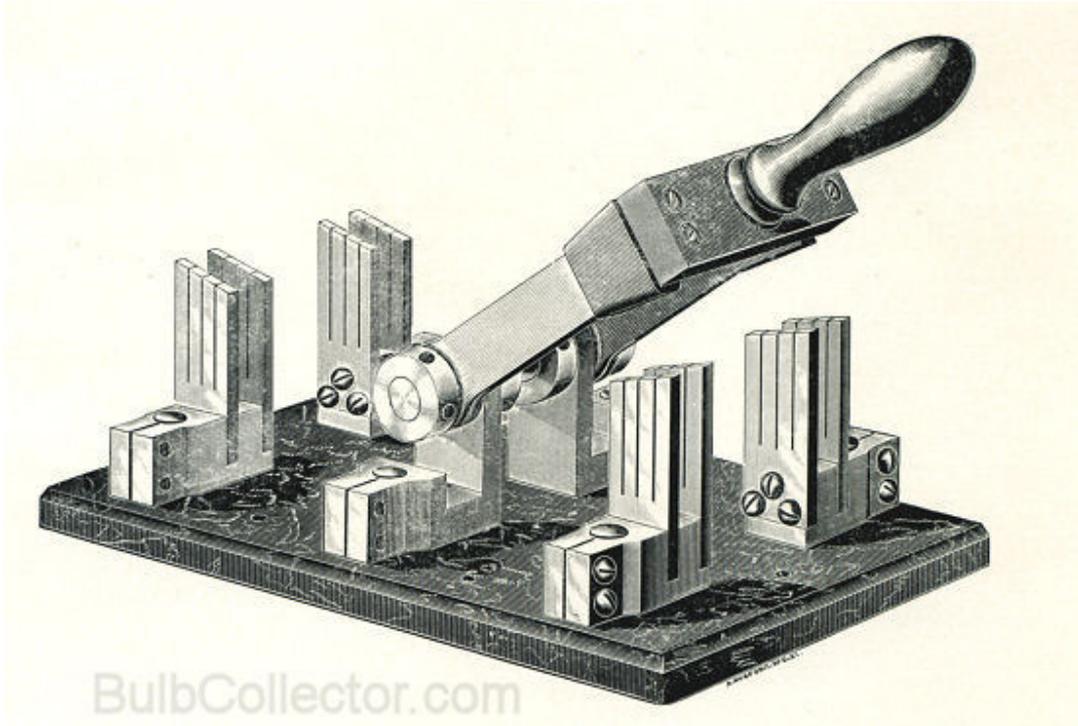
The Mather Switch

The accompanying cuts illustrate our Double-pole Knife Switches.

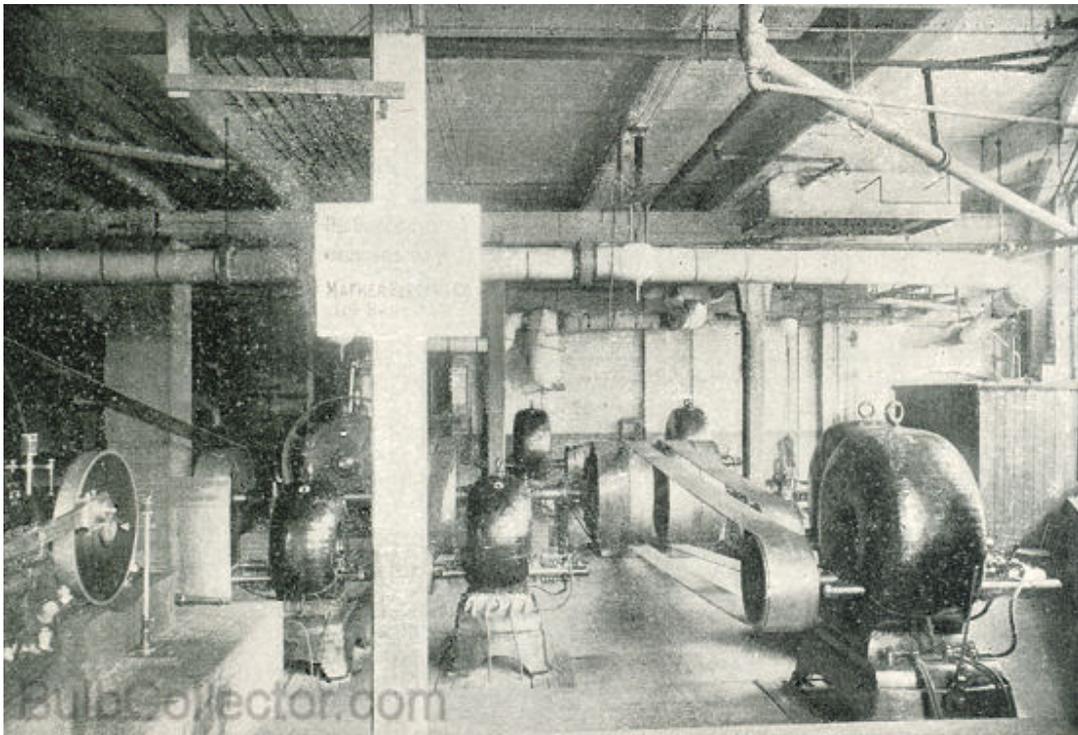
Each Switch is highly polished and mounted on either slate or marble base.



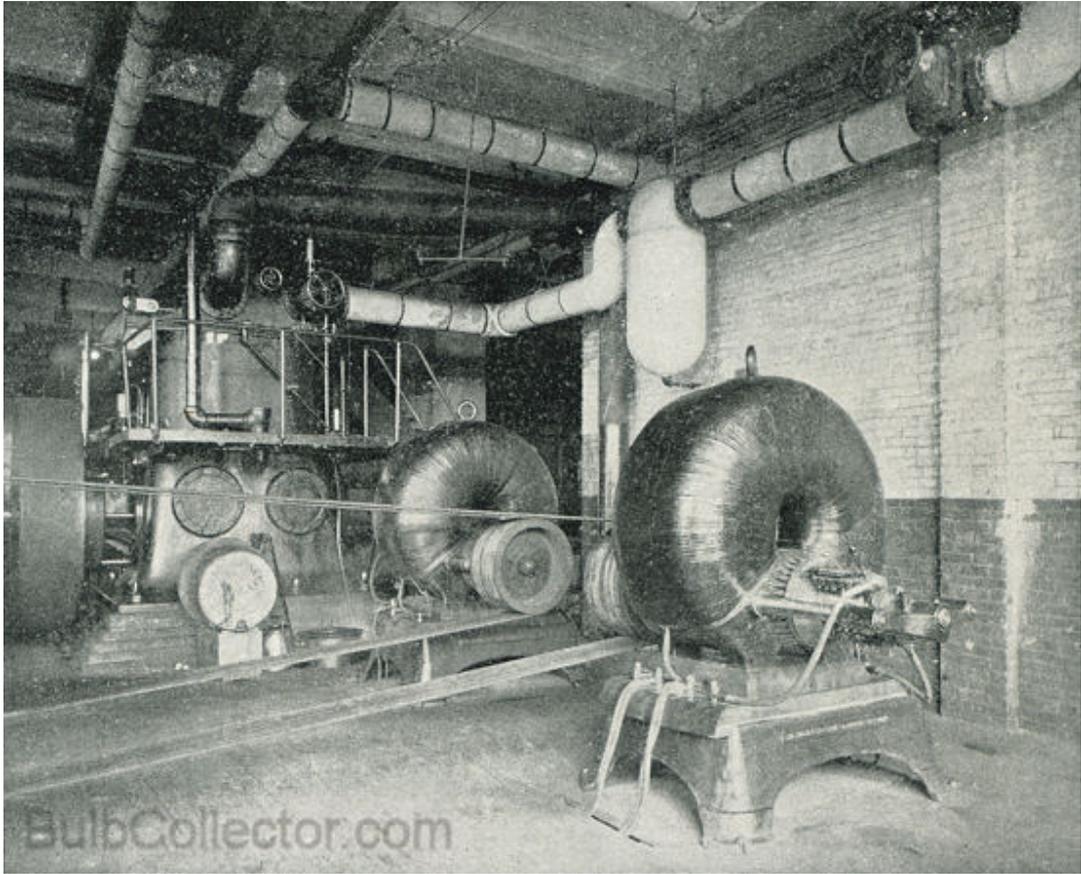
THE MATHER S.T.D.P. SWITCH.
Slate Base. Any Capacity.



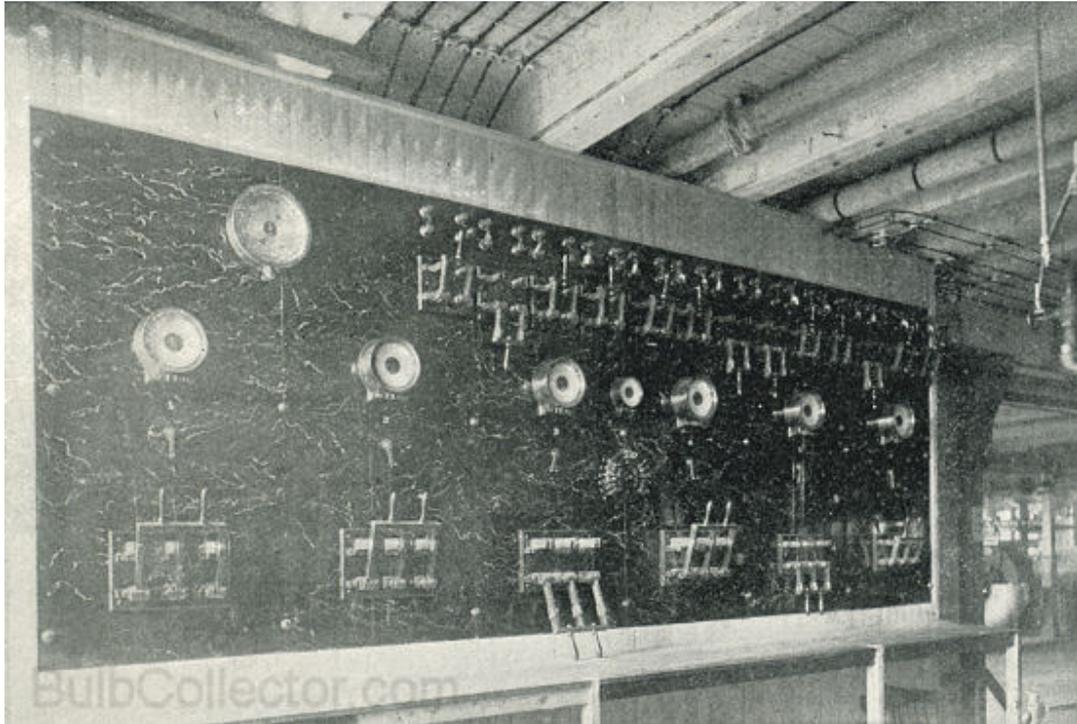
THE MATHER D.T.D.P. SWITCH.
Slate Base. Any Capacity.



INSTALLATION.
Massachusetts Mechanics Charitable Association.



INSTALLATION.
Massachusetts Mechanics Charitable Association.



INSTALLATION.

Massachusetts Mechanics Charitable Association.

Below we give a few names of customers who are well known to the general public. A full list of plants installed by the Company will be forwarded upon application

American Waltham Watch Co., Waltham, Mass.	St. Paul Pioneer Press. St. Paul, Minn.
Western Wheel Works, Chicago, Ill.	California Hotel & Theatre, San Francisco, Cal.
State Reformatory, Elmira, N. Y.	Davidson Theatre, Milwaukee, Wis.
Piscataquis Woolen Co., Guilford, Me.	Broadway Theatre, Denver, Colo.
Hinds & Ketchem, Brooklyn, N. Y.	Hotel Del Coronado , Coronado Beach, Cal.
Queen & Co., Philadelphia, Pa.	Hanna & Hogg, Chicago, Ill.
E. & J. Kock, Donaldsonville, La.	Knowles Loom Works, Worcester, Mass.
P. H. Glatfelter, Spring Forge, Pa.	North Packing Co., Cambridge, Mass.
Heuck's Opera House, Cincinnati, O.	Windsor Hotel, Denver, Colo.
Hartford Carpet Co., Thompsonville, Ct.	P. A. Marquan, Portland, Ore.
Amherst E. L. & Power Co., Amherst, N. S.	Aberdeen Flats, St. Paul, Minn.
J. Lorillard, Keyport, N. J.	Spaulding Hotel, Duluth, Minn.
Rumsey Bros., Mansfield, Mass. St.	Plimpton Mfg. Co., Hartford, Conn.
Joseph Court House, St. Joseph, Mo.	Warder, Bushnell, & Glessner, Springfield, O.
Deaf and Dumb Institute, Council Bluffs, Iowa.	State Capitol, St. Paul, Minn.
E. F. Weicket, Neenah, Wis.	Howland Mills, New Bedford, Mass.
Harrison Bros. & Co., Philadelphia, Pa.	Kerr Thread Mills, Fall River, Mass.
E. Meritt & Son, Houlton, Me.	Hennepin Avenue Theatre, Minneapolis, Minn.
State Industrial School, Nebraska. St. Paul	Mellen House, Fall River, Mass.
Apartment House, St. Paul, Minn.	Governor Evans Building, Denver, Colo.
Forest Paper Co., Yarmouthville, Me.	E. S. Jaffray & Sons, New York City.
St. Paul, Minn. & Man. R. R., St. Paul, Minn.	Wilkesbarre Lace Mfg. Co., Wilkesbarre, Pa.
Goodrich Trans. Co., Chic., Ill. " City of Racine."	J. N. Adam's Building, Buffalo, N. Y.

Goodrich Trans. Co., Chic., Ill. " City of Atlanta."
 Goodrich Trans. Co., Chic., Ill. " City of Virginia."
 L. L. Brown Paper Co., Adams, Mass. Farr
 Alpaca Co., Holyoke, Mass.
 Iowa Soldiers' Home, Marshalltown, Ia.
 Border City Mfg. Co., Fall River, Mass.
 The N. E. Shoe & Leather Ass'n, Boston, Mass.
 A. W. Perry, Church Green Block, Boston, Mass.
 H. B. Claflin Co., New York, N. Y.
 Joseph Bancroft & Sons, Rockford, Del.
 Woodward & Lothrop, Washington, D. C.
 Progress Club, New York, N. Y.
 Chamber of Commerce, Chicago, Ill.
 Youth's Companion, Boston, Mass.
 Tacoma Hotel Co., Tacoma, Washington.
 Kenilworth Inn, Asheville, N. C.
 Parsons Paper Co., Holyoke, Mass.
 Oxford Hotel, Denver, Colo.
 S. D. Warren & Co., Cumberland Mills, Me.
 Cheney Bros., So. Manchester, Conn.
 Amberg Theatre, New York, N. Y.
 Kittredge Building, Denver, Colo.
 Soldiers' Home, Grand Rapids, Mich.
 Athens Mfg. Co., Athens, Ga.
 State Almshouse, Tewksbury, Mass.
 Commercial Gazette, Cincinnati, O.
 E. Ingraham Co., Bristol, Conn.
 Providence Machine Co., Providence, R. I.
 New York Herald, New York, N. Y.
 U. S. Bunting Co., Lowell, Mass.
 Val Blatz Brewing Co., Milwaukee, Wis.
 Bennett Mfg. Co., New Bedford, Mass.
 Pairpoint Mfg. Co., New Bedford, Mass.
 State Hospital, Foxboro, Mass.
 King Philip Mill, Fall River, Mass.
 The Carson & Brown Paper Co., Dalton, Mass.
 Frazer, Farley & Co., Yokohama, Japan.
 Colt's Pat. Fire Arms Mfg. Co., Hartford, Conn.
 Keasbey & Mattison, Ambler, Pa.
 Thorn Building, Kansas City, Mo.
 Tarpon Springs Hotel, Tarpon Springs, Fla.
 I. M. Schulherr, Meridian, Miss.
 Endicott Building, St. Paul, Minn.
 National Starch Co., Glen Cove, N. Y.
 Kentucky Wagon Co., Louisville, Ky.
 State Insane Asylum, Lincoln, Neb.
 Evelyn Flats, New York, N. Y.
 Pope Mfg. Co., Hartford, Conn.
 Lockvood Mfg. Co., Waterville, Me.
 State Reformatory, So. Framingham, Mass.
 Providence Worsted Co., Providence, R. I.
 Putnam Woolen Co., Putnam, Ct.
 Hartford Light & Power Co., Hartford, Ct.
 Jones Bros. Electric Co., Cincinnati, O.
 Gooch Electric Light Co, Louisville, Ky.
 City of Webster, Webster City, Ia.
 S. & A. Crooks & Co., Hopkinton, Mass.
 Fitchburg Mfg. Co., Fitchburg, Mass.
 Nashua Card & Paper Co., Nashua, Mass.
 Morgan Envelope Co., Springfield, Mass.
 The Massachusetts Charitable Mechanics Association, Boston, Mass.

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It has always been our object to give our customers the *best* apparatus that science, money, and skilled labor can produce.

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